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<b>(21) International Application Number:</b> PCT/US91/08465 <b>(22) International Filing Date:</b> 13 November 1991 (13.11.91) <b>(30) Priority data:</b> 718,420 21 June 1991 (21.06.91) US <b>(71) Applicant:</b> WM. WRIGLEY JR. COMPANY [US/US]; 410 North Michigan Avenue, Chicago, IL 60611 (US). <b>(72) Inventors:</b> GREENBERG, Michael, J. ; 1633 Brighton Court, Northbrook, IL 60062 (US). VACCA, J., D. ; 620 Selborne Road, Riverside, IL 60546 (US). <b>(74) Agent:</b> GABRIC, Ralph, J; Willian Brinks Olds Hofer Gil- son & Lione, NBC Tower, Suite 3600, 455 North Cit- yfront Plaza Drive, Chicago, IL 60611-5599 (US).		<b>(81) Designated States:</b> AT (European patent), AU, BE (Euro- pean patent), BR, CA, CH (European patent), DE (Eu- ropean patent), DK (European patent), ES (European patent), FI, FR (European patent), GB, GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), NO, PL, RO, SE (European patent), SU <sup>+</sup> .  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>Before the expiration of the time limit referred to in Article 21(2)(a) on the request of the applicant.</i>
<b>(54) Title:</b> USE OF RICINOLEATE DERIVATIVE COMPOSITIONS TO REMOVE CHEWING GUM ADHERING TO SURFACES  <b>(57) Abstract</b>  Methods and compositions for the removal of chewing gum adhering to a surface are provided. In general, compositions comprising ricinoleate derivatives are used to remove chewing gum adhering to a surface.		

# **+ DESIGNATIONS OF "SU"**

Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

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-1-

USE OF RICINOLEATE DERIVATIVE COMPOSITIONS  
TO REMOVE CHEWING GUM ADHERING TO SURFACES

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BACKGROUND OF THE INVENTION

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Chewing gum oftentimes becomes adhered, either accidentally or intentionally, to various surfaces such as clothing, fabrics, carpets, masonry, plastics and ceramics. It is often difficult to remove all traces of the chewing gum from the surface to which it is attached without causing damage to the surface itself.

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Methods of removing chewing gum (chewing gum cuds as they are sometimes referred to) from various household surfaces have been employed in the past. Most of these methods, however, suffer from various shortcomings. For example, some methods require the use of flammable and/or toxic compositions that are harmful to humans as well as the surface being treated. Other methods require the use of relatively expensive compositions. Finally, some methods simply do not yield satisfactory results.

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Examples of some known methods include the physical removal of the chewing gum adhering to a surface with or without the application of heat or cold. Such methods, however, are oftentimes ineffective and can cause damage to the surface being treated. Volatile organic solvents have also been used to loosen chewing gum adhering to a surface followed by physical removal. Although somewhat more effective than the use of heat or cold, these organic solvents are undesirably toxic and/or flammable. Further, organic solvents can cause damage to the surface being treated and can be relatively expensive. The use of certain oils are also

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known for use in loosening chewing gum adhering to a surface. For example, essential oils such as orange oil have been used. However, oils are generally ineffective in satisfactorily loosening the chewing gum and also tend to stain the surface being treated.

The present invention is directed to novel compositions and methods of removing chewing gum adhering to a surface. The present invention utilizes compositions which are nonflammable, non-toxic, and relatively inexpensive. Furthermore, the compositions of the present invention cause little or no damage to the surfaces from which the chewing gum is removed.

#### SUMMARY OF THE INVENTION

Applicants have discovered novel compositions and methods for removing chewing gum adhering to a surface.

In one feature of the present invention, a method of removing chewing gum adhering to a surface is provided. According to this method, an amount of a composition containing a ricinoleate derivative is applied to the chewing gum. Thereafter, an amount of time is allowed to pass sufficient to permit the ricinoleate derivative to loosen the chewing gum's adherence to the surface. After such time, the chewing gum is physically removed from the surface.

Preferably, the chewing gum is removed by the application of a composition comprising methyl acetyl ricinoleate that has been heated to a temperature between about 50°C and about 70°C. An amount of time is then allowed to pass sufficient to permit the methyl acetyl ricinoleate to loosen the chewing gum from the surface. After such time, the chewing gum is physically removed from the surface.

In another feature of the present invention, a method of removing chewing gum adhering to a firm surface is provided wherein a composition containing a ricinoleate derivative is applied to the chewing gum. Thereafter, an amount of time is allowed to pass sufficient to permit the ricinoleate derivative composition to loosen the chewing gum's adherence to the surface. After such time, the chewing gum is gently scraped off of the surface. Preferably, methyl acetyl ricinoleate that has been heated to a temperature between about 50°C and 70°C is applied to the chewing gum.

In yet another aspect of the present invention, a method of removing a chewing gum adhering to a fabric is provided. According to this method, a composition containing a ricinoleate derivative is applied to the fabric on the side immediately opposite the chewing gum's point of adherence to the fabric. Thereafter, an amount of time is allowed to pass sufficient to permit the ricinoleate derivative to loosen the chewing gum's adherence to the fabric. After such time, the chewing gum is peeled off of the fabric. Preferably, methyl acetyl ricinoleate that has been heated to a temperature between about 50°C and 70°C is applied to the fabric.

In another feature of the present invention, a composition useful for removing chewing gum from surfaces is provided. The composition contains one or more ricinoleate derivatives and, preferably, methyl acetyl ricinoleate.

DETAILED DESCRIPTION OF THE  
PREFERRED EMBODIMENTS

5       The present invention is directed to novel methods  
and compositions for removing chewing gum adhering to a  
surface. Applicants have discovered that the use of  
compositions containing ricinoleate derivatives are  
surprisingly effective in removing chewing gum adhering  
10       to a surface without damaging the surface being  
treated. Furthermore, the ricinoleate derivative com-  
positions contemplated for use in the present invention  
have negligible flammability and toxicity, thus making  
these compositions safe for household use and storage.  
Also, these ricinoleate derivative compositions are  
15       relatively inexpensive.

      The present invention contemplates the use of  
various ricinoleate derivative compositions. The com-  
position may be a pure ricinoleate derivative, for  
example methyl acetyl ricinoleate (MAR) which is  
20       preferred. Or it may be a mixture of ricinoleate  
derivatives including MAR, methyl ricinoleate, glycerol  
mono-ricinoleate, glycerol diricinoleate, and propylene  
glycol ricinoleate. One example of a ricinoleate  
composition contemplated for use in the present  
25       invention is castor oil (also known as ricinus oil),  
which is obtained by cold-pressing the seeds of Ricinus  
communis L., Euphorbiatcae. Caster oil contains about  
87% by weight fatty acid glycerides of ricinoleic acid.  
As previously stated, however, the preferred  
30       ricinoleate derivative is methyl acetyl ricinoleate.  
It should be noted, however, that methyl acetyl  
ricinoleate may be more effective in removing some  
chewing gums than others. For example, it is believed  
that methyl acetyl ricinoleate is especially effective

in removing chewing gums having bubble gum type bases. Examples of such bases may be found in U.S. Patent Nos. 4,352,822, 4,357,355 and 4,452,820.

5 In a most preferred embodiment of the present invention, the ricinoleate derivative composition is heated to a temperature between about 50°C and about 70°C just prior to use in removing the gum cuds.

10 The method of removing chewing gum adhering to a surface may vary depending on the surface being treated. In general, application of the ricinoleate derivative to the chewing gum followed by physical removal will be most effective. In some instances, large quantities and repeated and/or prolonged application of the ricinoleate derivatives may be  
15 necessary for best results. Also, a follow-up cleaning with a mild detergent, such as a commercial clothing detergent or dishwashing detergent, may be desirable for removing the last traces of chewing gum and ricinoleate derivative. Following are some  
20 specifically preferred methods.

Where chewing gum is adhered to a firm surface such as wood or concrete, an amount of the ricinoleate composition sufficient to wet the chewing gum is placed directly on the chewing gum, especially around the  
25 boundary edges of the chewing gum. The chewing gum is then allowed to stand for a time sufficient to permit the ricinoleate derivative to loosen the chewing gum's adherence to the firm surface. Preferably, the chewing gum is allowed to stand for at least ten minutes.  
30 After such time, the chewing gum is gently scraped off of the firm surface. If traces of chewing gum remain, the aforesaid procedure may be repeated. After treatment with the ricinoleate derivative, the treated



surface is washed with an aqueous solution containing a mild detergent and subsequently dried.

Where chewing gum is adhered to a fabric such as cotton, wool, polyester, rayon or nylon, a few drops of the ricinoleate derivative composition is applied to the side of the fabric immediately opposite the chewing gum's point of adherence to the fabric. Of course, if this is not possible (i.e. in the case of carpeting or upholstery), the ricinoleate derivative may be applied directly to the chewing gum, and preferably at the boundary areas of the gum. In any event, once the ricinoleate derivative composition is applied to the fabric (or chewing gum), the ricinoleate derivative composition is allowed to remain for a time sufficient to permit it to loosen the chewing gum's adherence to the fabric. Preferably, the ricinoleate composition is allowed to remain for a period of at least about five minutes. After such time, the chewing gum is peeled off of the fabric. Thereafter, a cleaning cloth dipped in a ricinoleate derivative composition may optionally be used to remove any remaining chewing gum.

Of course, it should be understood that a wide range of changes and modifications can be made to the preferred embodiments described above. It is therefore intended that the foregoing detailed description be regarded as illustrative rather than limiting, and that it be understood that it is the claims appended hereto, including all equivalents, that are intended to define the scope of this invention.



ExamplesExample 1

Sticks of Wrigley Doublemint® brand chewing gum were chewed for about ten minutes and then pressed onto linoleum tile and allowed to remain for about four hours. The gum cuds were then removed according to several methods. The methods were evaluated by visual examination of the tile after removal of the gum cuds. The results were as follows:

(a) Application of ice until the cuds hardened followed by physical removal left a light haze on the affected area. A follow-up cleaning with an aqueous detergent solution failed to remove the haze from the affected area.

(b) Liberal application of isopropyl alcohol for a few minutes followed by physical removal removed 100% of the gum cud with no visible remnants on the affected area.

(c) Application of mineral oil followed by physical removal removed 100% of the gum cud with no visible remnants on the affected area.

(d) Application of methyl acetyl ricinoleate followed after a few minutes by physical removal removed 100% of the gum cud with no visible remnants on the affected area.

Example 2

Sticks of Wrigley Doublemint® brand chewing gum were chewed for ten minutes and the resulting gum cuds were pressed into half-inch pile synthetic carpet. The gum cuds were then removed according to various methods. These methods were then evaluated by visual

examination of the affected area. The results of these evaluations were as follows:

5 (a) Application of ice until the gum cuds hardened followed by physical removal was effective in removing about 95% of the gum cud.

(b) Application of isopropyl alcohol followed by physical removal removed about 99% of the gum cud. However, some discoloration of the carpet may have taken place.

10 (c) Application of mineral oil followed by physical removal was slightly less effective than isopropyl alcohol in removing the gum cud.

15 (d) Liberal amount of methyl acetyl ricinoleate was applied to the gum cud and allowed to stand for five minutes. Thereafter, physical removal removed about 99% of the gum cud. A follow-up cleaning with detergent or shampoo appeared necessary, however.

Example 3

20 Sticks of Wrigley Doublemint® brand chewing gum were chewed for ten minutes and the resulting gum cuds were adhered to a 100% cotton cloth. The gum cuds were then removed according to various methods. These methods were then evaluated by visual examination of  
25 the cloth subsequent to the removal of the gum cuds. The results of these evaluations were as follows:

(a) Physical removal was effective in removing only about 90% of the gum cud.

30 (b) Application of ice until the gum cud hardened followed by physical removal was effective in removing about 100% of the gum cud.

(c) Application of isopropyl alcohol followed by physical removal was effective in removing about 99% of the gum cud.

(d) Application of mineral oil followed by physical removal was effective in removing about 99% of the gum cud.

(e) Application of methyl acetyl ricinoleate followed by physical removal was effective in removing about 99% of the gum cud.

#### Example 4

Wrigley Hubba Bubba® brand bubble gum cuds were adhered to a 100% cotton cloth. Isopropyl alcohol and methyl acetyl ricinoleate were equally effective in removing the gum cuds. An aqueous soap solution was then applied to the cloth to remove oily residues.

#### Example 5

Hubba Bubba® cuds were adhered to unpainted cinder block. The methods described in Examples 1-4 were ineffective in removing the gum cuds apparently due to the penetration of the gum into the porous cinder block surface.

#### Example 6

Example 5 was repeated using a painted cinder block. Both isopropyl alcohol and methyl acetyl ricinoleate were effective in removing 100% of the gum cud.

#### Example 7

A Hubba Bubba® cud was adhered to a cement floor and allowed to set for an extended period. Methyl

acetyl ricinoleate was effective in removing 100% of the gum cud.

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As the above examples demonstrate, compositions containing ricinoleate derivatives are at least as effective in removing chewing gum adhered to a surface as isopropyl alcohol without the undesirable flammability properties associated with isopropyl alcohol.

## WE CLAIM:

1. A method of removing chewing gum adhering to a surface comprising the following steps:

5           applying to the chewing gum a composition  
comprising a ricinoleate derivative;  
          permitting the ricinoleate derivative to  
loosen the chewing gum from the surface; and  
          physically removing the chewing gum from the  
10       surface.

2. The method of Claim 1 wherein the ricinoleate derivative composition has a temperature of about 50°C to about 70°C.

15       3. The method of Claim 1 wherein the ricinoleate derivative comprises methyl acetyl ricinoleate.

20       4. The method of Claim 3 wherein the chewing gum comprises bubble gum.

5. A method of removing chewing gum adhering to a surface comprising the following steps:

25           applying to the chewing gum a composition  
comprising methyl acetyl ricinoleate having a temperature of about 50°C to about 70°C;

          permitting the methyl acetyl ricinoleate to  
loosen the chewing gum from the surface; and  
          physically removing the chewing gum from the  
30       surface.

6. A method of removing chewing gum adhering to a firm surface comprising the following steps:

applying to the chewing gum a composition  
comprising ricinoleate derivative;  
permitting the ricinoleate derivative  
composition to loosen the chewing gum from the surface;  
5 and  
gently scraping the chewing gum off the  
surface.

10 7. The method of Claim 6 wherein the ricinoleate  
derivative composition has a temperature of about 50°C  
to about 70°C.

15 8. The method of Claim 6 wherein the ricinoleate  
derivative comprises methyl acetyl ricinoleate.

9. The method of Claim 8 wherein the chewing gum  
comprises bubble gum.

20 10. A method of removing chewing gum adhering to  
a fabric comprising the following steps:  
applying a composition comprising a  
ricinoleate derivative to the fabric on the side  
immediately opposite the chewing gum's point of  
adherence;

25 permitting the ricinoleate derivative  
composition to loosen the chewing gum from the fabric;  
and  
peeling the chewing gum off of the fabric.

30 11. The method of Claim 10 wherein the  
ricinoleate derivative composition has a temperature of  
about 50°C to about 70°C.

12. The method of Claim 10 wherein the ricinoleate derivative comprises methyl acetyl ricinoleate.

13. The method of Claim 12 wherein the chewing gum comprises bubble gum.

14. A composition useful for removing chewing gum adhering to a surface comprising a ricinoleate derivative.

15. The composition of Claim 14 wherein the ricinoleate derivative comprises methyl acetyl ricinoleate.



# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US91/08465

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) * According to International Patent Classification (IPC) or to both National Classification and IPC U.S. CL: 008/137 INT CL: (5) D06L 1/02		
<b>II. FIELDS SEARCHED</b> Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
208	137	
252	Dig. 19	
436	003 & 006	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched *		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT *</b>		
Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
Y	US, A, 3,666,492 (TENG, ET. AL.) 30 MAY 1972 Col. 4, lines 69-70).	1-10
Y	US, A, 3,883,666 (TENG ET. AL.) 13 MAY 1975 Col. 6, line 10	1-10
Y	US, A, 4,459,311 (DE TORA ET. AL.) 10 JULY 1984 Col. 3, lines 50-51	1-10
Y	Grant & Hackh's CHEMICAL DICTIONARY 5 ED. pp. 327 & 455 MCGRAW-HILL (1987)	1-10
* Special categories of cited documents: <sup>10</sup> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
08 FEBRUARY 1992		18 MAR 1992
International Searching Authority		Signature of Authorized Officer
ISA/US		JOHN F. MCNALLY